

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[PRICE 6D.]

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overboard" the interests of those whom he professes to address, he would lead us to infer that the manufacture of copper was the main point, and that the raising of ore was but secondary.

Again he remarks—"When we advert to the circumstance that a considerable portion of what is sent to this country is the produce of English capital, I cannot but ask what is the proper policy to be adopted in fixing the amount of duty?" (which, to him, seems almost self-evident, and which he thus describes)—"To make such a reduction only on copper ore in this country, as to induce the importers to land it, not for the purpose of smelting only, but so as to lead to the manufacture of it in Great Britain; at the same time to retain such a portion of the tax upon it as shall at once be a considerable protection to the mines of this country." Now, in the first place we would ask Mr. BASSETT, will he, as a free trader, hold out a premium to the English capitalist to employ his resources in foreign lands in preference to his native country?—We last week stated that full 300,000*l.* had been realised by the employment of British capital in Cuba and Chili, whereby the capital so embarked is taken from this country to employ the foreign miner, and further to afford to other nations those advantages which we have ever claimed as one of the proudest boasts of England, not merely the enjoyment of capital, but the energy, enterprise, and liberal spirit which characterise all our adventures, and which we are now affording to other countries in preference to our own. Why, we would ask, is the English capitalist, who employs his capital in the mines of Spain, to be considered by our Government more than he who advances his money to aid the Spanish finance, and takes their bonds in return? Let the Minister deal out equal justice, and we shall not complain—but when we find that to aid the British capitalist, who makes his investment in foreign mines, Government not only affords to him advantages which he never contemplated, but holds out a boon to others to employ their capital in foreign climes, and further that by such suicidal act he destroys his national resources, so far as the mineral wealth of this country is concerned, as well as throwing on the country the expense of supporting a vast population, whose means of existence is taken from them—it behoves us to consider whether such measures can be upheld and supported by honourable men.

We contend not—but let us again turn to the party investing his capital in foreign funds, and, as we are on Cuba, which is a Spanish possession, Spanish bonds will be a good case in point. Years after years have passed by without interest being paid on the capital—compromises have been made—the alteration in the value of the bonds has ruined thousands—and yet the Minister is passive and silent under a loss of millions, which has been abstracted from the nation, while, to gain support in his other ministerial measures, he listens to a few influential Members or capitalists, possessing influence—at the same time, adopting the principles of the Whig ministry, which they had not power enough to carry out. By so doing, he gives to the capitalist whose attention is directed to foreign mines, an addition to his wealth, and leaves the foreign fundholder, whose entire property has been sacrificed, to help himself; such conduct is most highly reprehensible, and cannot, even by Sir C. LEMON on the opposition, or Mr. BASSETT on the Whig-Conservative side, be justified.

Mr. BASSETT, in stating that he considers these measures of the Ministers are highly to be commended, yet, at the same time, expresses himself anxious "to retain such a portion of the tax as shall at once be a considerable protection to the mines of this country," but which protection he leaves to be determined by "more practical men" than himself. Now, as a protection, to be considerable, must first be established to be a protection at all, and as such cannot be argued to be the case by the most special pleader, without it be first proved that the miner is secured by obtaining a remunerative price for his labour; and, further, that the mine adventurer has the prospective advantages which he has a right to expect from the employment of his capital, and the risk he incurs—we beg to tell Mr. BASSETT that his arguments are based on false premises, and that he must first establish the fact, that the new tariff is, in the slightest degree, a protection, much more "a considerable protection," ere he expresses his confidence in the prudence which the Minister has exercised. Mr. BASSETT further tells us, "it has been stated that the Cornish mines must be abandoned, in consequence of the reduced duty," but, adds he, "my opinion is far otherwise." If that the honourable gentleman takes Carn Brea, with dues of 1-24th, liberally granted by the family of that gentleman (the late highly-respected Lord DE DUNSTONVILLE, the best lord which Cornwall ever knew) to a set of liberal adventurers, the produce of which is good, and the monthly cost comparatively small, so as to allow of even a reduction in the price of copper, and, at the same time, yield dividends (although reduced), he is right; but, if he will take the generality of mines, and more especially those of low produce, and of considerable depth, where the expense of raising, dressing, carriage, shipping, and returning charges, are so heavy, he will find good reason to alter his opinion. He says, taking the average price of Cornish ore at 95*s.* or 96*s.* per ton, the reduction of duty will be about 6 per cent. only, and then proceeds to compare such reduction with that of corn, leaving out of consideration the introduction of the product of foreign ores into our home market; but we would—assuming Mr. BASSETT to be right in his calculations—leaving wheat and all other comparisons out of the question—ask that gentleman, whether the tin and copper mines of Cornwall have realised, for the past twelve months, 6 per cent. on the capital embarked? and whether, if he was a land or fundholder, he would so readily fall into a reduction of 6 per cent., which, in itself, forms the profit?—if we alone take the Consolidated Mines, with an outlay of 60,000*l.* to 70,000*l.*, we should find that 6 per cent. gave 3500*l.* to 4000*l.* a year in the way of profits—no trifling consideration in times like the present. We are next told, that, "with respect to the policy of lowering the duty on copper ores imported, it is to be recollected we are suffering much from foreign competition in very many articles of manufacture, in the making of steam-engines and many kinds of machinery, in woollen cloths, in silk, &c.; now, some of these manufactures either are, or ought to be, peculiarly our own." Here, again, peers out the advocate of the manufacturing, and not the mining, interest. What relation, we would ask, has the manufacturer of copper with the points to which the writer refers? We answer, as to trifling, as to be beneath notice, except, as in the present instance, to afford a base, however insignificant, on which to would propose to raise his structure. We next arrive at a sentence which carries with it all our feelings. Mr. BASSETT says—"What we have a right to insist on is this—that the Government should approximate, as much as possible, to justice, without giving any unnecessary stock to individual interests." We then ask, has Government done this? Mr. BASSETT applauds the measure—*ex. sup.*

We feel that we have already occupied space sufficient for the present work, in directing attention to the subject, which, after the discussion which has taken place in our columns, may be weary to many of our readers; we shall next week close our notice of the pamphlet, and, at least, attempt to reply to the writer, who, with every kindness of feeling, evinces a want of knowledge (at least such is our opinion) of the matters on which he offers counsel and advice.

We again defer offering any observations on the question between Mr. CHARLES WYLLIAMS and Mr. SAMUEL HALL, for the reasons given in our last. We purpose next week devoting some space to the consideration of the question at issue, and to those points which appear to us the "bone of contention" be-

tween the parties. We owe to Mr. WILLIAMS an apology for not having noticed the dates of Mr. HALL's patents, and given our explanations, but as the question involved other matters, which our want of space has not allowed us to enter upon, we must crave the indulgence of that gentleman and our readers. Where is Mr. HALL's letter of a correspondent, in our columns of to-day, should claim his attention.

LECTURES ON GEOLOGICAL MINERALOGY.

On Wednesday, the 12th instant, Mr. Tennant delivered, at the King's College, his introduction to a course of lectures "On Geological Mineralogy." During the course of the lecture, the Professor, after giving a brief, but most able, history of the rise and progress of mineralogy, from Pliny to the present time, in a striking manner explained the intimate connection which exists between mineralogy and chemistry, as relating, not only to the arts, but to the ordinary and constantly proceeding operations of Nature. He then entered into some very interesting details of the first principles of mineralogy, and explained, in the clearest manner, how different minerals were to be distinguished, entering at some length into the laws laid down by the earliest mineralogists for the distinguishing and arranging of minerals, more especially those of Werner, which have been greatly improved upon by more recent mineralogists, as Jameson, Aikin, Phillips, Brooke, Miller, and others. One remarkable occurrence was mentioned—that in the collection formed by Werner far better specimens of English minerals were to be found than can be met with in many of the first-rate collections in this country, which circumstance the Professor attributed to the extraordinary industry and enthusiasm of the pupils and followers of that first of mineralogists. This lecture treated entirely upon the first elements of mineralogy, and is to be followed by others of a more scientific nature, which will appear in this Journal. A series of specimens, not only from the museum of the college, but from Mr. Tennant's own collection, was introduced, to illustrate the lecture, and from the practical knowledge and skill of the Professor, much instructive and interesting information is expected to be given in the ensuing lectures.

SULPHUR TRADE.

According to official statements, published at Naples, a considerable decrease in the exportation of sulphur from Sicily was exhibited for the year 1841, as compared with that preceding, as evidenced by the following returns:—1840. Total export to all countries. 732,750 cantars. 1841. " " " " " 187,101 "

Decrease for twelve months. 546,649 cantars. This decrease within a single year affords to our mind conclusive evidence of the effect produced on the foreign supply by working our home mines. The export from Sicily to England, which in 1840 reached 393,533 cantars, was, in 1841, reduced to 20,330, or only one-twentieth the amount.

MINING IN SPAIN.—It appears there is some foundation for the rage for mining speculations now existing in Spain, if we may judge from the extraordinary success alluded to in the following extract from a letter, the original of which we have seen, dated Toledo, October 4, received from a mining engineer, now engaged taking surveys previous to the formation of a company in London:—"A mine in the Sierra de Almagra, in the south of Spain, has been set to work by a company in sixty-four shares; only ten dollars per share has been paid, and last year the dividend was 18,000 dollars per share. It is said that the mine is now producing 1000*l.* worth of silver per day. The shares are quoted at 70,000 dollars each, but no sellers. I am expecting that ours may prove equally rich; from all I can see and hear I am in high spirits, but next week will bring my report."—This party has discovered two mines of quicksilver, which we may be enabled to speak more fully on next week.

IRON GALVANISATION.—(From a correspondent).—Several papers, in informing the public that the iron tubing of the Artesian well at Grenelle was concluded, also stated, erroneously, that the wrought-iron tubes were tinned. The tubes are not tinned, but galvanised, which is quite a distinct preparation, for the tin or the lead used in tinning constitutes the iron to the electro-positive state—hence it results, that, instead of preserving that metal from rusting, the tin and lead increase the oxidability of the iron, because, under this circumstance, the iron attracts, through the tinning, the oxygen which combines with it, and destroys more promptly than if it had not been tinned, which is a fact well known by electricians; when, on the other hand, the zinc with which the galvanisation is effected constitutes the iron to the electro-negative state, and in this case it causes the iron to repulse (if I can say) the oxygen of the air, and thus it cannot be oxidised. The preservative galvanic action is such, that a tube, for instance, only galvanised either inferiorly or exteriorly, when it remains immersed in the water, as in the tubings of the Artesian wells, the iron works of sluices, and for the iron sheathing of ships; it would be sufficient, in these various cases, that some points only were covered of the galvanic tinning, to preserve all the pieces of the oxidation either in the places not galvanised.

HALL'S CONDENSERS.—We are given to understand that Mr. Samuel Hall's condensers are now being applied by Messrs. Maudslay and Field, to a pair of new engines of 220-horse power, to her Majesty's steam-ship the *Black Eagle*; and also by Messrs. Seaward and Capel, to a pair of engines of 650-horse power, to her Majesty's steam-frigate *Penelope*.

IRON CORDAGE.—We learn, from the *Valencienais Journal*, that a manufacture of iron cordage, after the manner practised at Buzon, in Prussia, has been established at Condé, in the north of France.

ENORMOUS CHIMNEYS.—(From a correspondent).—The two largest chimneys in the world are those belonging to Messrs. Charles Tennant and Co., of Scotland, and James Muspratt, Esq., of England. The dimensions, &c., of the two are as follow:—

	Scottish.	English.
Height	150 ft. 6 in.	160 ft. 6 in.
Diameter at base	40 ft.	45 ft.
Diameter at summit	11 ft.	12 ft.
Number bricks contained in each	3,000,000	3,500,000

THAMES TUNNEL.—We are glad to find that a medal has been struck, to commemorate the successful accomplishment of that great national undertaking, the Thames Tunnel. It is a well-merited tribute to the talent and perseverance displayed by the able engineer, Sir I. M. Brunel, F.R.S., of whose ability we have had the pleasure of recording so many satisfactory proofs.

DEPTFORD FIER.—This undertaking, which has cost the shareholders 60,000*l.*, was sold, at the Auction Mart, on Wednesday, for a sum very far below its value; the purchaser was Mr. T. Tyrell, who, we believe, had advanced a considerable amount towards completing the works. The pier has a frontage of 500 feet, and about as much depth.

THE STEAM SHIP "HINDOSTAN."—We are requested to state that letters from Gibraltar, by the *Madrone* steamer, announce the arrival of the *Hindostan* at that port, on the 28th ult., having run the distance from the Needles to Gibraltar (about 1200 miles) in 121 hours—being at the rate of ten knots an hour.

NEW DYE.—The shrub *harmala pagonum carmela*, which grows in a wild state on the sandy steppes of the Crimea, has been found to contain a very rich colouring matter, by M. Gschel, professor of chemistry at the university of Dorpat (Russia). This shrub is now called the *harmala red*, and is produced in such quantities as to become an article of commerce.

At a late meeting of the Paris Academy of Sciences, a communication was made, by M. Thénard, on the means of retaining for a long period in a limited quantity of air, by the absorption of the carbonic acid gas exhaled, and the renewal of oxygen in proportion to its consumption. That the carbonic acid gas exhaled, and which, in excess, becomes fatal, may be absorbed by lime, is a well-known fact, but as it is necessary, in the purification of air, to replace the oxygen, which is the vital principle, as well as to get rid of the excess of what is injurious, the great object to be attained is, in cases where, as in diving-bells, it is important to make the same limited volume of air serve for several hours, is to produce oxygen with ease and certainty. M. Thénard proposes to employ oxygenated water, and has shown that not less than 472 times the volume of water of oxygen gas may be compressed in this vehicle, and subsequently liberated as required. But to produce this result great care and expense are necessary, and, when obtained, the difficulty of preventing the escape of the oxygen when not wanted for immediate use is also very great.

ORIGINAL CORRESPONDENCE.

MR. HALL'S "SMOKE CONSUMING" PATENT.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—In forwarding to you my further reply to Mr. Hall, I have to request a place in your next Number for a few observations in answer to your correspondent, "A North Wales Subscriber," and his mistakes respecting my "spike boiler;" and also in justification of those principles on which my mode of introducing air to the combustible gases generated in furnaces has been based. C. W. WILLIAMS.

Dublin, Oct. 10.

CONSUMPTION OF SMOKE—MR. HALL'S PATENT.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I presume the advertisement, of which the enclosed is a copy, having appeared in the columns of the *Manchester Guardian* of the 19th of January last, has escaped your notice, and that of Mr. C. W. Williams, who, I observe, is carrying on a literary warfare with Mr. Hall. As regards Mr. Hall, of Edinburgh, named therein, that gentleman is, I believe, interested only in Ivason's patent, described at some length in the *Mining Review*, accompanied by a diagram, the principle being the introduction of a jet of steam taken from the boiler direct to the furnace, and dispersed over the fire. I believe the smoke was consumed, but the want of economy in fuel, and injury done the boilers and fire-bars, I understand, counteracted the advantages. This patent, at least, I cannot see as an infringement of Mr. Hall's, and I have reason to believe that the injurious effects have been, in some degree, remedied. My object in addressing you is to inquire of Mr. Samuel Hall, through the medium of your paper, whether he ever published his pamphlet, and, if so, through what channel I can obtain it? My own impression is that it is "all smoke." Leeds, Oct. 7. J. L.

P.S.—The following is copy of the advertisement referred to by our correspondent:—

LESSON BOOKS NECESSARY.—In the first week in February next will be published Mr. Samuel Hall's letter respecting his patent apparatus for the consumption of smoke, addressed to William Beckett, Esq., M.P., chairman of the above meeting. Also, a second letter to the committee then appointed, in which Mr. Hall will establish his claim to the originality of his invention, and the priority of his patent for the only method which (although sought for during the last half century) has been devised for the perfect consumption of smoke, unattended by such loss of fuel, diminution of the powers of the boilers for the generation of steam, additional labour to the engineer, and other practical mischiefs, as the proprietors of the steam engines and other furnaces could not submit to. In this letter Mr. Hall will clearly show that the plans submitted to the above meeting by C. W. Williams, Esq., and — Bell, Esq., of Edinburgh, are merely clumsy imitations and infringements of his patents. Mr. Hall, in the meantime, suggests to all parties the propriety of deferring infringements on his patents until they have perused his forthcoming statements, as well as the respective specifications of his patents, and those of the subsequent ones obtained by the two gentlemen above mentioned.

SOUTHAMPTON DOCKS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I now beg to address to you a few remarks on the "Specifications for works," so often alluded to by Mr. Smith at the meeting at the George and Vulture of parties interested in the above company. In the specification for the work tendered to be done by Messrs. McKay and Hadden, for 231,600*l.*, there is a positive provision, that, in case of any dispute with contractors, the same shall be referred to two parties (if not undertaken by Mr. Gilles alone), so that the reference to Mr. Macneil is, as I have before said, altogether improper. Why do the directors, then, persevere in their purpose on this head? If not, because it gets rid of the question of their own responsibility to the shareholders, for, sooner or later, depend upon it, the shareholders will call for an investigation. In the other "Specification"—that involving 22,600*l.* (a mere bagatelle!)—there is no mention at all made about arbitration or security for due performance of works, neither is there any clause to the effect that the engineer may have a right to alter the plan without invalidating the whole contract; or any other troublesome matter of the kind—I mean of the kind which might prove troublesome to the contractor—but which is generally considered, I believe, rather as a proper security for a company.

Now, what I recommend is this—that the directors forthwith (like the Blackwall Railway directors) refrain from taking their 1000*l.* per annum salaries till things are on quite a different footing; also, that, as they know the proprietors cannot find that which does not exist (I allude to ten proprietors, with each fifty shares), and that, consequently, a Committee of Investigation cannot be had without the directors' actual permission, that the directors, of their own accord, grant an investigation, particularly as they say they intend, when next they go to Parliament, to get the clause in their present Act about appointing a committee of investigation altered; to enable our company, in that respect, to have no greater difficulty than the Great Western Railway (both companies being of equal magnitude!)—I say, let them forestall the Act, securing the injunction of the present clause, as they say they do, and at once grant an investigation; and, for a "form," I hand them that of their chairman (Mr. Ligges), who proposed a committee of investigation in the affairs of the Mail Packet Company a few days since:—"That a committee of seven proprietors, three to be a quorum, be appointed to investigate the affairs of the company—such committee to report to a general meeting of the shareholders the result of its labours, the power being vested in it for the production of persons and papers necessary to be examined." Now, I admit this form is a very good one—I do not say all I could in its praise is true—but that arises from my recollecting the saying in *Thucydides*—"Pessimus genus inimicorum laudantes." However, should the directors not consider that equal necessity exists for investigation in the affairs of the two companies alluded to—meaning ours and the Mail Packet Company—I will mention a circumstance which may materially enhance the claims of our own company. Yesterday, having heard that there had been a taking down of certain walls of the "Shed" in course of construction, I wrote for information, and received it, in a letter from the secretary, in those words:—"Objections having been found to the creation of a closed shed on the north-west quay, the directors have decided to transfer its position to the north quay, and that so much of it as had been begun on the north-west, about one-third of its length, and four feet in height, was thereupon taken down, as you have been informed." The exact nature of the "objections" the secretary does not disclose. I hear the old objection is the real one—that the walls wanted a foundation to stand upon, which could not be found exactly in the locality fixed upon:—what says the engineer? Now, Mr. Editor, would you credit it, this is the third time (independently of the time when a long range of piles were driven into the mud, at the expense of some thousands, I believe to be drawn out again) that we shall have been compelled, as I maintain, through not having proper Contracts, and proper Securities from Contractors, to do our work twice over. The only difference this time from former ones—I mean when we had to underpin the dock entrance walls, and to rebuild the dock retaining walls (of a dock not yet opened):—is, that this time the necessity for the change has found its way to the knowledge of the directors a little sooner than in former cases, but now not till just about the time the Directors had promised that the shed should be finished, and the company put in receipt of income:—I notice, by the way, in the papers, that a frigate *Tender "the Shed"* is wanted. Shall we have a dispute with the contractor for the first shed to refer to John Macneil, Esq., C.E., his decision to be final? Really, such management appears most extraordinary, and I fear that in time the shareholders will lament their own supineness. City, Oct. 12. T. R.

NATURAL HISTORY OF DIAMOND.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—In the *Mining Journal* of the 17th September last I read, with a considerable interest, a short paragraph relating to this beautiful mineral substance, wherein it is made to appear that diamond is a changed and crystallized vegetable body. The opinion long entertained by myself is, that diamond is of animal, and not vegetable, origin, and, in the absence of the work mentioned, I see nothing to make me alter that opinion. Diamonds, in the East Indies, are found in beds of fine sand running within the solid rock, being sometimes of the true octahedral form, but, generally speaking, their exact form is indistinguishable; they are sometimes found encasing worms, grains of sand, and other extraneous bodies, which appearance would warrant the conclusion that they were once in a soft state; they are laminated, showing a series of depressions more applicable to animal than vegetable secretion; the beds in which they are produced contain siliceous bodies as greatly resembling diamond that the miners are often compelled to pass them under the hammer, and, when the mine is exhausted, its excavated material being thrown into it, and offered to remain for sixty years, new diamonds are generated, and the mine may, and has been known to be, once more worked to advantage.

Diamonds are also found as exudations from other minerals—such, for instance, in the *symples of diamond* attached to a piece of gold in the British Museum; they aggregate much after the same manner as do silicious globules, and, in general, in beds of primary granites, and tropical heat appears to be a necessary auxiliary to their origin and growth. Microscopical observations may detect resemblances to vegetable cellular tissue, but the same resemblances may, with equal propriety, be derived from the membranous texture of animals.

The chemical combinations necessary to produce diamond are at present unknown, but in this era of discovery, when knowledge overcomes all difficulties, the problem will not remain long unsolved. It is stated that the natural process of generation is an exceedingly slow one, and by no means accelerated by a high degree of temperature; but, as experience proves, they form in the space of sixty years in a dry hot soil, while the mineral coal forms under a lower degree of temperature as a black powder, which is said, as regards diamond, to result from a high temperature. Vegetable bodies, by artificial heat being applied, are converted into carbon; animal matter, under certain combinations, becomes a carbonaceous product—the one and the other, by the intrusion of foreign matter, becomes converted into silica, but of the causes of the changes so widely apart from each other chemists know comparatively nothing. Cornelians are produced by Nature from the rude silicious pebbles in three years; they are produced by art from the like material in eight days—here the art of man assists Nature in her purposes. Why not so with diamond? The crude material must, of necessity, be abundant in all parts of the world; all that is necessary is, to examine well the beds in which diamond is produced, the nature of the material of which these beds are composed, and the temperature and other causes which accelerate the result. Diamond is a compound mineral substance, which is capable of being converted into carbon on the application of intense heat, but this is no demonstrative proof that carbon can be concentrated so as to become diamond, any more than it may become charcoal or coal, for it is possible that the act of decomposition and recombination of the elements in action may produce the result carbon, and the same reasoning may be applied to numerous bodies subjected to violent action, and, consequently, to violent change, by the element, for the law of synthesis cannot always be carried out by the analyst. Was diamond pure carbon only, it would be uniform in its qualities, but, in common with all other known products, it is variable in its qualities; thus we have diamonds, more or less brilliant, variously coloured and discoloured, and varying in the disposition of their particles.

London, Oct. 12.

ON WATER-WHEELS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Allow me to ask Mr. Budge whether he lays it down as an axiom, that a 43-foot wheel should have a crank three feet long, or about one-eighth of the radius, and that the cranks of all other wheels should be in the same proportion to their diameter? If so, the crank of a 10-foot wheel would not be eight inches long. Now, Sir, it is generally believed that cranks from two to four feet in length are the most convenient and efficient for mining purposes, whatever the diameter of the wheel may be; therefore I shall leave the public to judge whether the absurdity lies with me or the *Practical Miner's Guide*—and give two other examples of two 12-foot wheels, with their cranks two and three feet long, calculated from Mr. Budge's rule; which rule I beg to lay before the readers of the *Mining Journal*, that those who may not be acquainted with it may see that I have not deviated, in the least, from the instructions therein given. Mr. Budge's rule runs thus:—

1. Multiply the length, breadth, and depth of the bucket together, and divide by 284; multiply the quotient by 10.2 lbs., the weight of a gallon of water.—2. Multiply the diameter of the wheel by 3.1416, and divide the product by the circular space occupied by each bucket—the quotient will show the number of buckets contained in the wheel.—3. Multiply the third part of the number of buckets by the weight of water contained in one.—4. For the leverage.—From the radius deduct the length of the crank, and the remainder divided by the length of the crank, will give the operative length of the lever; multiply the weight of water in one-third of the wheel by this length, and the product will show the full, or entire power.—Lastly, From this product cut off one-fifth for friction, and the remainder will show the net, or real power of the wheel.

EXAMPLE 1.—Required the power of a wheel twelve feet diameter, buckets thirty inches long, twelve inches deep, and six inches wide, with a space of 11 inch between each bucket, and the crank three feet long?

1. To find the quantity and weight of water in each bucket— $30 \times 12 \times 6 = 2160 \div 284 = 7.60 \times 10.2 = 78.13$.

2. To find the number of buckets contained in the wheel— $12 \times 12 = 144 \div 3.1416 = 45.83 \div (6 \div 11) = 62$.

3. To find the weight of water on one-third of the wheel— $62 \div 3 = 20.66 \times 78.13 = 1614$.

4. To find the power of the lever— $12 \div 3 = 4 \div 3 = 1.33 \times 1614 = 2145.72$.

Lastly, For friction— $1614 \div 5 = 322.8$; then, $1614 - 322.8 = 1291.2$ lbs., the actual power of the wheel lifting six feet high, or 7740 lbs. one foot high, at an expense of 56104 lbs., or from 13 to 14 per cent.

EXAMPLE 2.—Required the power of a wheel twelve feet diameter, buckets thirty inches long, twelve inches deep, and six inches wide, with a space of 11 inch between each bucket, and a crank two feet long?

1. To find the quantity and weight of water in each bucket— $30 \times 12 \times 6 = 2160 \div 284 = 7.60 \times 10.2 = 78.13$.

2. To find the number of buckets contained in the wheel— $12 \times 12 = 144 \div 3.1416 = 45.83 \div (6 \div 11) = 62$.

3. To find the weight of water on one-third of the wheel— $62 \div 3 = 20.66 \times 78.13 = 1614$.

4. To find the power of the lever— $12 \div 3 = 4 \div 2 = 2 \times 1614 = 3228$.

Lastly, For friction— $3228 \div 5 = 645.6$; then, $3228 - 645.6 = 2582.4$ lbs., the actual power of the wheel lifting six feet high, or 15494 lbs. one foot high, at an expense of 56104 lbs., or from 17 to 18 per cent.—thus making a difference of about one-fourth in the power of two wheels, of equal dimensions, with only a difference of one foot in the length of the cranks.

Now, Sir, this is enough to convince any one in his right senses that the absurdity is not in me, but in the *Practical Miner's Guide*. I have calculated these examples literally from the rule there given, and I shall now leave it to the intelligent readers of your valuable Journal to determine the value of Mr. J. Budge's rule for finding the power of water-wheels.

Widow Enyon, Oct. 19.

MINE SKITS.—No. VI.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—It has, perhaps, been satisfactorily shown that no man has a right to impose a duty of death or misery. Men cannot, in the nature of things, like a wolf or an eagle, be appropriated to the private use of any single individual. Miners constitute a portion of the wealth of nations, which may emphatically be said to belong to all, though confined to the locality of the land of New, where Cain desires to dwell "alone in their glory." The spot described or comprised within the boundary of an estate purchased by the savings of industry, bequeathed by will, or inherited by descent or collateral consanguinity, may satisfy the owner to consumption called "duty," but can never confer the right to prevent the dissevering of the genus of the womb of the solid deep, or any other of the gifts of Omnipotent Providence to the debilitated land of the Continent, or his island was a prebend of his mind a groutier. We, therefore, proceed to consider the geological reasons why an Act should be passed by the Parliament to compel owners of lands in great plenty to work the all beneath the grace of the field, the house of the free, the head of the hill, the column temple, or the bed where we do sleep so well. We will first bring into our view a synopsis of the whole, as embodied in the following proposition, which we will hardly dispute.—"That the principal segments in support of a similar Act to compel the granting of mine-sites."—When land or minerals are to be divided, boundaries improved, lands formed, new streets, bridges, aqueducts, or railways made, or any improvement proposed, which the expenditure of money, land, labour, and other causes prevent being accomplished, the Legislature says it shall be done. The what ground?—On the ground of public utility, though often the interest of individual rights or private advantage. The more where the owner becomes his sheep, and his wild forest, or had he had to work his land in the winter home, is granted to another. By what law?—By the authority of an Act of Parliament. The lands where the father died

his note, or pushed off his little barque, "walking the waters like a thing of life," in fish the river or the brine, are become the property of those that "go down to the sea in ships, and do business in great waters." For whose benefit?—For the benefit of the commonwealth. The river in which the old man bathed when a boy, or staid in the setting sun, or by which he listened to its song by moonlight, is now a commercial canal. Where is his little garden?—Ask public utility. The house in which were born the ancestors of ten generations, entailed for ever, is no more. "The busy tribes of flesh and blood" have raised its deep foundations, for the street is widened by public utility. Goldsmith's village is "deserted," and we hear the breaking of the bones of the dead, for the churchyard itself, with the dust of the departed, is winged by the breath of public utility, and we may see walk to the railway station the worshippers of God, where men, after prayers were over, were wont to be carried to the narrow house. What did all this, and much more?—Acts of Parliament. Some men have been improved, some sent to slay and to be slain, property taxed, and the present generation, who have long paid poor rates, pinched for the benefit of the next, who may be more independent. And why?—For the good of the State—for the commonwealth, to be sure. In short, the principle has long been recognised by the legislators of both Houses, that the real or imaginary good of the few must sometimes be sacrificed for the good of the many, and that private control over local property, as well as persons, must be interfered with for the benefit of the community at large. Apply this principle to the granting of mine-sites, and we are at once introduced to the preamble of "A Bill to Empower Judges, &c., to make Orders for the Granting of Sets, and, if necessary, to Grant the same, to Work and Search for Mines, Metals, and Minerals."

Penzance, Sept. 20.

A. T. J. MARTIN.

IMPERIAL SLATE COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—Having seen, in the last Number of the Journal, a notice of a dinner given to the workmen of the Imperial Slate Company, at their quarries, near Killaloe, I would beg to remark, that though I cannot find fault with the directors for their evidence to their workmen their approbation of their conduct on the occasion alluded to in your paper, I would still, as a friend to candour and above-board dealing, inquire the reason that they (the directors) have published but one half-yearly report of their proceedings (and that the first half-year they held the principal quarry after their purchase of it from the Mining Company of Ireland), the more particularly, as they then brought into the market a large amount of new shares; and, certainly, that was not the time to keep the public in the dark with respect to their "profit" or "loss," but trusting that the directors will see the justice (when they bring shares into the market) of letting the public know the real value of the article they offer for sale, I hope soon to be informed, through the medium of your very useful Journal, whether the Killaloe slate makers are really "making wages or going in debt."

Rathfrum, Oct. 10.

A. SUBSCRIBER.

We are disposed to think our correspondent is in error on more than one point. We have other letters with reference to this company, which want of space precludes insertion this week.

THE NEW TARIFF.—THE MINING INTEREST.

TO THE EDITOR OF THE WEST BRITON.

SIR,—In my remarks on Mr. Basset's pamphlet, in your paper of the 23d ult. (see *Mining Journal* of October 1st), I endeavoured to show that the new tariff has a tendency to give undue facilities to the admission of poor copper ores into England for smelting, which class of ores will probably not be smelted at all unless in this country—and at the same time to discourage the importation of the richer ores, which can be smelted without difficulty elsewhere. It appears that Mr. Basset has not overlooked this tendency in respect of the former, for he says that "the greatest danger is to be feared from the importation of the poorer ores;" and yet, although the duty in this case is so low as to evade, to a great extent, the fair claim of the British miner to protection, he dismisses the point without the slightest animadversion, and he passes over entirely unnoticed the still more serious danger of the richer ores being driven, by an excessive duty, to be smelted abroad—forming, in all probability, the foundation of a rival market, inimical alike to the British miner and smelter, and to the various important interests connected with them. I think that, at least, he might have spared his eulogy on Sir Robert Peel, as having on this occasion "acted with prudence on the principles of commercial freedom." Of the "freedom" used there can be no doubt, but I cannot perceive the "prudence" of the measure, nor its justice to any legitimate British interest. The most plausible plea for the unduly favoured importation of poor ores is, that it gives considerable employment to shipping; but I am sure that the public feeling and interests are equally opposed to depriving the brave and deserving men who navigate our coasts of their bread, in order that British labour may be sacrificed, upon an increased scale, to British cupidity, in the pestiferous port of St. Jago de Cuba; and in the ill-fated British miner being subjected, in any degree, to greater privations, that capitalists and slave owners—including mine agents—may more rapidly acquire wealth by "slaves bought and sold."

Mr. Basset regulates the intermediate language which a newspaper writer appears to have used on the subject. So far as the outcry of "wages in sheep's clothing" might be calculated to create a prejudice against the late highly respectable mining proprietor, I repudiate it also; but he greatly misrepresents the character of his countrymen, when he thinks it necessary to "soothe the fears" which could be created in their minds to any serious extent, by an appeal, from whatever quarter, not based on just and sufficient grounds. He may rest assured that whilst they have justice done them by those at whose hands they have a right to expect it, they will remain satisfied and orderly members of society, despite any sinister attempt to disturb them; and further, that their views on this particular subject are neither visionary or unreasonable. They are fully aware that there are very extensive and rich deposits of copper ore abroad, and that they must come into competition with our producers, and that an Cornish, or even British influence, can prevent it. But when all parties admit, as they have done, that the British miner is entitled to a reasonable protection against the foreigner, in respect of the latter smelting his ore in this country, and when the protection afforded him can be proportionately low in one case, and excessive, and prospectively injurious in the other, they cannot be expected to be satisfied—or are they?

Mr. Basset speaks of his "endeavouring to soothe the fears of the hard-working man, by placing before him such facts as are most likely to disarm his natural alarm." I should be happy to perceive any facts having such a conciliatory tendency—I should be happy could I even believe in their existence. They are not, at all events, to be found in Mr. Basset's book, nor do they appear to have the effect on his mind which he would fain produce on others, for, in page 16, he says broadly that "our producers must be protected at a cheaper rate"—the very thing which "the hard-working man" is alarmed about!

The Cornish standard has, I believe, averaged (at 77 pounds) about 112% for the last ten years; it has averaged about the same for the last three years of that period, and it is now fully equal to it. Notwithstanding this, and generally steady rise has prevailed, and that, during the last period the price both of mining labour and mining materials has greatly declined (the former lamentably so), the produce of the mines has decreased, and, in the face of all this, we have Mr. Basset's positive assertion that "one producer would be obtained at a cheaper rate!"

Mr. Basset endeavours to reconcile us in this "cheaper rate," by a reference to the introduction of the plough into the West Indies, and by the hope that what has happened there, and elsewhere, may also "happen" in the Cornish mines; and that, by "a better economy" in our mining operations, our produce may be "obtained on easier and less expensive terms." I confess that I can see no adequate ground of consolation in the fact that the "plough" having superseded the hoe in the West Indies; nor do I understand that the effect of that change there has been to lessen the expense of production. I learn from the report of a committee of the House of Commons, that gratifying as the result of emancipation has been to the friends of humanity in other respects, it does not include the produce being raised upon "easier and less expensive terms"—quite the contrary. As Mr. Basset's professed consolation from abroad does not, therefore, appear to avail us, I propose to inquire in my next what they may be in that which is offered us at home—"a better economy in our mining operations!"

Oct. 5.

A. MIXER.

ISLANDS RAILWAY.—(From a correspondent.)—A rope upwards of three miles long, and weighing fifteen tons, has been recently supplied to the directors of the Edinburgh and Glasgow Railway, by Messrs. Haggis, of Glasgow. It is heavier by five tons than any line ever manufactured before, and is intended for a tunnel on that line of railway.

PREVENTING FIRE.—The patent lately taken out by Messrs. Hadley, Robinson, and others, for purifying and condensing smoke and noxious vapours, has been put into operation with a most satisfactory result. The smoke from a reverberating smelting furnace has not only been entirely condensed, but the whole of the heat from and deleterious vapours prevented from escaping into the atmosphere, and the metallic particles recovered, which promise to be attended with most important consequences to the mining districts.—*See also Advertiser.*

New Zealand consists mainly of two large islands, situated about 1300 miles east from Australia, called the Middle Island and the North Island, separated by the passage of Cook's Strait, with numerous smaller islands scattered around these shores. They lie between 34 deg. and 45 deg. of south latitude, and 166 deg. and 176 deg. of east longitude. The southern, or Middle Island, is about 500 miles long and from 100 to 150 broad. The northern island is the smaller, being about 400 miles long, and from 50 to thirty broad, the two being estimated to contain nearly 50,000 square miles, of which two-thirds are fit for cultivation. New Zealand is distant from England about 16,000 miles. These islands are evidently of volcanic origin, there being many extinct and a few active volcanoes in the interior of the islands. Hot springs have also been found, the heat of some of them being higher than boiling point, and most of them are of a sufficient temperature to cook any kind of food; one spring in particular is mentioned as having a very remarkable quality, the water being to the touch as soft as oil, and without the use of soap, or any alkali, except the water itself contains, will cleanse the dirtiest garments, removing every particle of grease, however soiled they may be with it. A chain of mountains runs through the whole of the southern, and a considerable part of the northern island, some of which are as high as 6000 feet above the level of the sea, their tops being covered with perpetual snow, and their sides with furst firs and luxuriant forest. Besides this chain of mountains, there are other subordinate ranges, which, for the most part, are covered with vegetation to the tops. From these mountains originate numbers of fine streams and rivers, several of the latter being navigable to a considerable extent, and possessing waterfalls, which afford the means of establishing mills in most parts of the country. These rivers, from the peculiar shape of the islands and the mountains which intersect them, do not run to any very great length, from 10 to 150 miles being the average, but still they are, in many instances, navigable for vessels of large tonnage to the extent of thirty to forty miles, and for boats to a still greater length; the Hutt River, which falls into Port Nicholson, is said to be navigable for forty miles. The bays and harbours of New Zealand are not surpassed, either in number or advantages, by those of any country in the world. In the North Island there are the Harbour of Waikato, the Bay of Islands, the Frith of Thames, the Bay of Plenty, Poverty Bay, Hawke Bay, and the most important of all, Port Nicholson, situated in Cook's Strait, and where numerous settlements are now being formed. This bay is about twelve miles long and three broad, perfectly sheltered, and ships may enter or leave with any wind. The depth of water is from seven to eleven fathoms, and the whole bay is of sufficient capacity to hold a navy. The River Hutt falls into this port, the banks of which are high and well wooded. There are several harbours on the west coast, but most of them have the disadvantage of a bar at the entrance; the principal are the harbours of Hokitika and Kaikara. In the southern island, within Cook's Strait, is the fine harbour of Queen Charlotte's Sound, which is nearly thirty miles long; it is perfectly sheltered, and the soundings show ten fathoms a cable's length from the shore. At the north-western extremity of this island is Cloudy Bay, which runs fifteen miles inland, and is about four miles broad. Besides these there are many others, such as Lookers-on Bay, Port Gore, Taranaki's Gulf, Admiralty, and others which have not yet been properly surveyed.

With respect to the climate of New Zealand, all accounts agree in describing it as very salubrious. In the summer the thermometer ranges from 64 deg. to 80 deg., while in winter it is seldom below 45 deg.; but ranging from 40 deg. to 60 deg., and, as a proof of the mildness of that season, the trees never shed their leaves until the old ones are pushed off by the succeeding leaves in spring. The climate of New Zealand has one very great advantage over that of Australia, is not being subject to the severe droughts which often destroy the hopes of the farmer in that country. The soil appears to admit every part to be very excellent, and well adapted for cultivating all sorts of grain; and, indeed, most European vegetables. The forest trees grow to a very great size, and are most of them admirably adapted for ship and house building, and also for furniture. Flax is another important vegetable production, and which is likely to form an article of considerable export for the manufacture of ropes, &c. Mr. McDonnell says of it:—"All the standing, and part of the rearing, rigging of the *Sir George Murray*, a ship of 400 tons, belonging to myself, was laid up from New Zealand flax; it had been over the mast-head for nearly three years. I can state that better rope never crossed a ship's mast-head."

Her spars, one and all, were of New Zealand pine—they were faultless." An able author on the vegetable productions of New Zealand, sums up his account in the following words, which speak volumes, and the more so that experience has already tested, in a recent measure, the truth of his prognostications:—"New Zealand is fitted by Nature for the production in abundance of those three articles which have always been regarded as the especial signs of the plenty, wealth, and luxury of a country—corn, wine, and oil. Its fertile plains adapt it to the easy cultivation of grain, for the surplus production of which it will possess a ready market, from its vicinity to New South Wales and Van Diemen's Land, where, from the high profits of wool-growing, grain from foreign countries will always find a ready demand; and the New Zealand harvests may be safely anticipated to be free from the influence of those destructive droughts which must ever be ruinous to the prospects of agriculture in Australia. The vine has been already found to thrive luxuriantly in the islands, and the possibility of its successful cultivation, both for home consumption, and export, admit of no doubt. We have previously cited the proof of a strong resemblance in the volcanic soil of Italy in the northern island, and there is good reason to believe that the wines, not only of Italy, but of Spain, Portugal, and the south of France, might be brought to us as great perfection as in those countries." But little is known of the mineral productions of New Zealand, no geological survey having been made, but iron and coal are found in abundance, as well as manganese, bitumen, freestone, marble, and sulphur. There is also abundance of clay fit for brick-making. Birds are very abundant in the woods, and fish around the shores and in the rivers. Whales also visit the coasts, and are caught in large numbers; this trade is very considerable, and will, no doubt, much increase. The native population of New Zealand can only be guessed at, but that of the north island was estimated by the Rev. Mr. Williams at 100,000, which the most recent accounts state to be nearly correct.

The first attempt to colonise New Zealand was made in 1825, by a company under the auspices of the Earl of Durham, but the idea of settling the land acquired was soon abandoned. The Church missionaries have acquired considerable tracts of land in different parts of the islands, and have introduced many farming improvements along with the religious instruction, which they have bestowed upon the natives; they have ten stations, with fifty-four schools, and 1431 scholars; there are also five Wesleyan missionary stations. A company under the name of the New Zealand Association was started in 1837, and another under the name of the New Zealand Colonisation Company in 1838, both of which have now merged into the New Zealand Company, established in May, 1839, and which is now engaged in carrying out plans in an admirable manner for the settlement of the country. When this company started into existence, the minds of individuals of all orders were ripe for affording it encouragement, as a proof of which we need only state, that, entirely upon the faith of being able to purchase land, and effect settlements, it issued proposals to sell 100 sections of land, each section to consist of 100 acres of country, and one acre of town land; 10 similar sections being reserved for the use of native settlers. These, the principal settlements were to consist of 1100 sections, or, in all, 111,100 acres, and, although these sections had as yet no geographical situation, the exact location of the settlements being uncertain, although it had always been anticipated that Port Nicholson would be selected, yet, within seven weeks, purchasers had come forward for the whole of the disposable sections, and the company had in the treasury, to purchase money, 50,000, of which 7,000, the company was reserved to be employed in carrying out labourers, the remainder being for expenses and profit to the company. The company had in contract, at the outset, with the difficulty of the British Government refusing its concurrence to the plan of settlement, but, ultimately, the Government found it advisable to send out a *Liberal* Governor to New Zealand. The whole proceedings of the company, and of those dealing with it, from a single and striking example of that confidence between parties which is only justified in its simplest form, amidst a community considerably advanced in civilization, far and only one the ground of the first settlement paid for before it had a European establishment, but, before its existence was yet known in Britain, nine ships, containing 1135 emigrants, had been dispatched to it. Colonel Wakefield, who had preceded this expedition, after purchasing several valuable tracts of land in the parts of the North Island most advantageously situated for commercial trade at last upon Port Nicholson for the free and principal settlement, and left at last in going to terms with the natives. The amount paid, of course, is not published, but the natives were highly pleased with their bargain, and were eager to sell more of their land. Other companies besides that represented by Colonel Wakefield had, in the meantime, been taking steps for procuring the colonisation of New Zealand—viz., the Plymouth Company of New Zealand, the New Zealand, Manakoa, and Wakefield Company, and the Pacific New Zealand Colonisation Society, the first of which is now incorporated with the New Zealand Company. By the terms of a proclamation, issued by the Lieutenant-Governor (Capt. Hobson, R.N.), and dated 20th of January, 1840, it was made obligatory that all who had purchased land in New Zealand should give their rights to a commission appointed with certain powers from a Governor and his private council of New South Wales. The terms of building lots in the chief towns (Wellington) has become very high, as will be seen, when it is stated that as much as 10,000,000 of pounds sterling has been paid for land in the city. Many valuable tracts of land have been purchased in all parts of the islands, which are, in general, the strongest of the whole of the islands. The promises belonging to

PRICES OF MINING SHARES.

and advertisements are requested to be forwarded, post paid, October 1, 1900.